

In re Application of
Ryoji Kaneko

App. No.: 10/709971
Filed: 6/10/2004
Conf. No.: 3970
Title: BRUSH TYPE DC ELECTRIC MACHINE
Examiner: E. Preston
Art Unit: 2834

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

APPELLANT'S BRIEF

REAL PARTY IN INTEREST

In addition to the appellant, the real party in interest is his assignee, Kabushiki Kaisha Morie, a Japanese company.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that would have a bearing on or be affected by the decision in this appeal.

STATUS OF CLAIMS

Claims 1 through 22 remain in this application and all are before the Board on appeal.

STATUS OF AMENDMENTS

The final rejection in this case was mailed on September 20, 2005. After conducting a telephonic interview in this case on November 21, 2005, during which a proposed amendment was discussed generally during which the Examiner stated that he felt that the proposed amendment would raise a new issue. The amendment was filed by fax on December 5, 2005, after consultation with the client. On December 19, 2005, the Examiner refused entry on the basis that the amendment raised new issues.

In response the undersigned filed a Notice of Appeal and Request for Entry on the next day, December 20, 2005, as it was believed clear that no new issue was raised, and that point will be discussed below in Appellant's Arguments. Even though the time for filing the Brief was running, the undersigned really believed that the Proposed Amendment should be entered since it responded to the position first expressed by the Examiner during the phone interview that he was reading the rejected claims in a way clearly inconsistent with their intent and which reading should have resulted in a search of the clearly defined invention, as expressed in not only the claims, but also the description in the specification.

The Undersigned was forced to renew his unanswered petition on March 19, 2006, which was not responded to until after a recent call to the Examiner's Supervisor. This resulted in a denial of the request Mailed on August 1, 2006, more than 7 months after the filing of the request and outside of the statutory period for response to filing of the Notice of Appeal. A petition for withdrawal of the technical abandonment of the case and any due extension fees is filed herewith.

SUMMARY OF CLAIMED SUBJECT MATTER

Turning to the subject matter first of claim 1, the only independent claim and the support therefore in the specification and drawings it recites the environment of a DC electric machine, identified by the reference numeral 21 and described initially in Paragraph 0028. This machine comprises a shaft, the rotor shaft identified by the reference numeral 31, first described in Paragraph 0031. This rotor shaft 31 is rotatable about an axis defined by bearings, indicated at 32, and first described in Paragraph 0031. A plurality of circumferentially spaced permanent magnets, indicated by the reference numerals 25 are disposed around the rotational axis, As first described in Paragraph 0030. These magnets cooperate with a plurality of circumferentially spaced magnetic pole teeth, indicated at 27 as also first described in Paragraph 0030 and face the permanent magnets. Electrical coils, indicated at 29, are wound on the magnetic pole teeth as also described in Paragraph 0030. A plurality of circumferentially spaced commutator segments, indicated at 35 and described in Paragraph 0032, have clearances between adjacent edges to which ends of the coil windings are connected. One embodiment of such a connection is shown in FIGS. 2A-2C. A plurality of brushes, indicated at 35, are disposed in sliding contact with the commutator segments for the transfer of electrical energy between the coils and the brushes, as described in Paragraph 0033.

Up to this point, the structure is generally the same as conventional rotating electrical machines. The heart of the invention is found in the placing of the coil ends for connection to selected of said commutator segments so that electrical energy flows through adjacent coil pairs in the same circuit in opposite directions upon rotation of the machine and examples of such constructions are shown in the various embodiments illustrated in FIGS. 2A-2C; FIGS. 3A-3C; FIGS. 4A-4C; FIGS. 5, 6 and 7; FIGS. 11A-11C; FIGS. 12A-12C; FIG. 13A; FIG.13B; FIGS. 14A-14C and FIGS. 15A-15C. Each embodiment is fully described in the specification as are their relative advantages.

This feature is important in improving the performance of the machine by suppressing energy loss due to phase shift in the coils. Phase shift appears in the form of electromagnetic energy loss when windings of adjacent coils are energized in opposite directions to each other. Therefore, to prevent phase shift, it is desirable that adjacent coils are energized in opposite winding directions as the flow directions reverse upon rotation adjacent windings are energized in the same direction.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The issues to be decided by the Board are as follows:

1. Is the subject matter of Claims 1-3 and 12 anticipated by US Patent 6,819,025 (Egawa et al)?
2. Is the subject matter of Claims 4-11 and 13-22 obvious under 35 USC 103(a) by the modification of Egawa et al in view of the alleged teaching of US Patent 6,891,304 (Cros et al) ?

APPELLANT'S ARGUMENTS

DOES EGAWA ET AL ANTICIPATE CLAIM 1?

No! Claim 1 clearly defines patentably over Egawa et al in emphasizing the problem solving construction forming the heart of appellant's invention. That is that "so that electrical energy flows through adjacent coil pairs in the same circuit in opposite directions upon rotation of said machine". This condition is shown, for example, in FIG. 2B, as reproduced below:

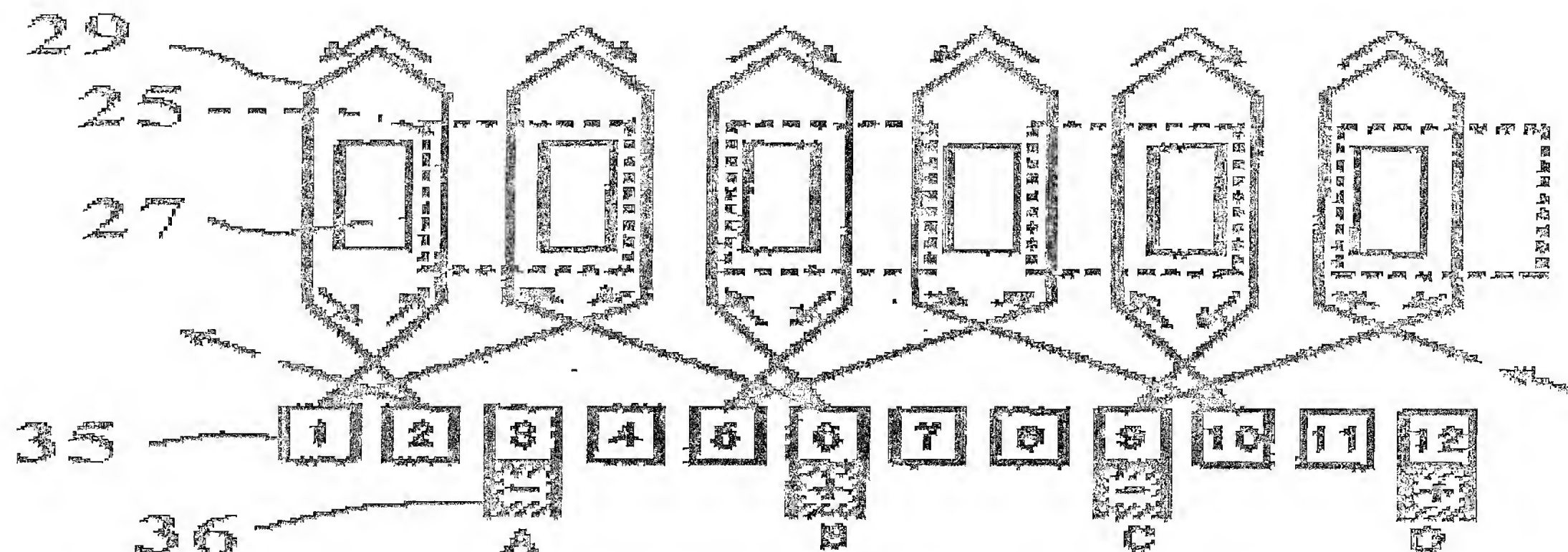
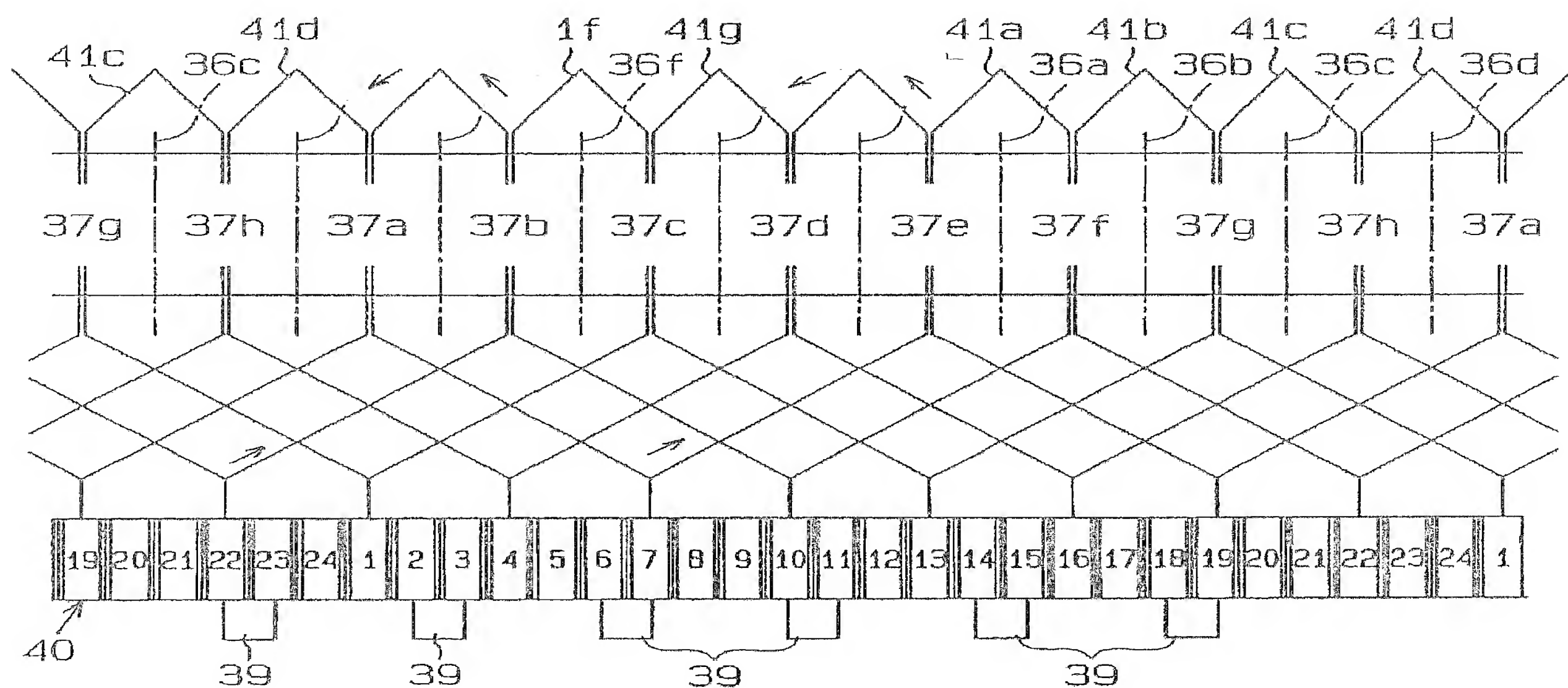


FIG. 2B

The Board's attention is directed to the oppositely directed arrows indication the instantaneous current flow directions in adjacent coil windings of the same circuit.

Compare this with the marked up copy of Fig. 4 of the reference to add the current flow arrows.

Fig. 4



From this it should be obvious that the flow of current through adjacent coil windings of the same circuits are in the same, not opposite directions.

The Examiner's position is that the flow through each winding of the reference reverses upon rotation and that certainly is true as that is how AC Electrical Machines operate. However that is not what appellant has claimed. To repeat, the claim states "so that electrical energy flows through adjacent coil pairs in the same circuit in opposite directions upon rotation of said machine". The Board must remember that the machine will not rotate unless electrical power is either applied in the case of an electric motor or is being driven by another prime mover in the case of an electrical generator. In either case the current flow at any given time is in the same direction in adjacent coils of the reference, as seen above, not in opposite directions as is claimed. One can not ignore the description in the specification and drawings in construing the claims.

Again it should be stressed that no reference of record including the primary reference is directed to the invention disclosed herein. That is improving the performance of the machine by suppressing energy loss due to phase shift in the coils. Phase shift appears in the form of electromagnetic energy loss when windings of adjacent coils are energized in opposite directions to each other. Therefore, to prevent phase shift, it is desirable that adjacent coils are energized in opposite winding directions as the flow directions reverse upon rotation adjacent windings are energized in the same direction.

Finally appellant would like to stress that the Examiner's position in refusing to enter the proposed amendment after Final on the basis that it raised a new issue is an admission that the reference does not anticipate the claim language. Set out below is the refused amendment to claim 1.

1. (Presently Amended) A DC electric machine comprising a shaft rotatable about an axis, a plurality of circumferentially spaced permanent magnets disposed around said axis, a plurality of circumferentially spaced magnetic pole teeth facing said permanent magnets, electrical coils wound on said magnetic pole teeth, a plurality of circumferentially spaced commutator segments having clearances between adjacent edges to which ends of said coil windings are connected, and a plurality of brushes in sliding contact with said commutator segments for the transfer of electrical energy between said coils and said brushes, said coil ends being connected to selected of said commutator segments so that the instantaneous electrical energy flows flowing through adjacent coil pairs in the same circuit is in opposite directions upon rotation of said machine.

In refusing to enter this amendment, the Examiner stated "The addition of instantaneous electrical energy that flows through adjacent coil pairs in the same circuit raises a new issue that requires further consideration and/or search on the part of the examiner". What did he in fact search? This is believed to be an admission that the reference does not anticipate what was clearly expressed as the invention, even as originally claimed and is present in the claims before the Board.

Claims 2, 3 and 12 stand or fall with claim 1.

The patentability of the remaining claims will not be argued separately due to their inclusion of the subject matter already argued. Hence these claims also stand or fall with claim1.

Respectfully submitted:



Ernest A. Beutler
Reg. No.19901

Attachment: Credit Card Authorization for Brief Fee
Petition to consider Brief filed timely

Phone (949) 721-1182
Pacific Time

APPENDIX
CLEAN COPY OF CLAIMS ON APPEAL

1. A DC electric machine comprising a shaft rotatable about an axis, a plurality of circumferentially spaced permanent magnets disposed around said axis, a plurality of circumferentially spaced magnetic pole teeth facing said permanent magnets, electrical coils wound on said magnetic pole teeth, a plurality of circumferentially spaced commutator segments having clearances between adjacent edges to which ends of said coil windings are connected, and a plurality of brushes in sliding contact with said commutator segments for the transfer of electrical energy between said coils and said brushes, said coil ends being connected to selected of said commutator segments so that electrical energy flows through adjacent coil pairs in the same circuit in opposite directions upon rotation of said machine.
2. A DC electric machine as set forth in claim 1, wherein the coil ends of adjacent pairs are connected to commutator segments that are spaced from each other by at least two commutator segments that are not connected to any coil winding.
3. A DC electric machine as set forth in claim 1, wherein both ends of the winding of each coil winding are connected to the commutator segments, across each other and across one end of the winding of an adjacent coil winding.
4. A DC electric machine as set forth in claim 1, wherein the number m of permanent magnets is an even number of four or more, the number t of the magnetic pole teeth is $m+2$, the number s of the commutator segments is $2t$ and the number b of the brushes is m .
5. A DC electric machine as set forth in claim 1, wherein the number m of the magnets is four, the number t of the magnetic pole teeth is six, the number s of the segments is twelve, and the number b of the brushes is two, three or four.
6. A DC electric machine as set forth in claim 5, wherein the coil ends of adjacent pairs are connected to commutator segments that are spaced from each other by at least two commutator segments that are not connected to any coil winding.
7. A DC electric machine as set forth in claim 6, wherein each of the 12 commutator segments is connected in parallel to another commutator segment spaced six segments from it.
8. A DC electric machine as set forth in claim 2, further including a second series of coil windings formed around each of the pole teeth and connected to the commutator segments that are not connected to the first mentioned series of coil windings.
9. A DC electric machine as set forth in claim 8, wherein electrical energy flows through adjacent coil pairs in the second series of coils in opposite directions upon rotation of said machine.

10. A DC electric machine as set forth in claim 9, wherein the number m of permanent magnets is an even number of four or more, the number t of the magnetic pole teeth is $m+2$, the number s of the commutator segments is $2t$ and the number b of the brushes is m .
11. A DC electric machine as set forth in claim 10, wherein the number m of the magnets is four, the number t of the magnetic pole teeth is six, the number s of the segments is twelve, and the number b of the brushes is two, three or four.
12. A DC electric machine as set forth in claim 1, wherein the machine comprises an electric motor.
13. A DC electric motor as set forth in claim 12, wherein the coil ends of adjacent pairs are connected to commutator segments that are spaced from each other by at least two commutator segments that are not connected to any coil winding.
14. A DC electric motor as set forth in claim 12, wherein both ends of the winding of each coil winding are connected to the commutator segments, across each other and across one end of the winding of an adjacent coil winding.
15. A DC electric motor as set forth in claim 12, wherein the number m of permanent magnets is an even number of four or more, the number t of the magnetic pole teeth is $m+2$, the number s of the commutator segments is $2t$ and the number b of the brushes is m .
16. A DC electric motor as set forth in claim 12, wherein the number m of the magnets is four, the number t of the magnetic pole teeth is six, the number s of the segments is twelve, and the number b of the brushes is two, three or four.
17. A DC electric motor as set forth in claim 16, wherein the coil ends of adjacent pairs are connected to commutator segments that are spaced from each other by at least two commutator segments that are not connected to any coil winding.
18. A DC electric motor as set forth in claim 17, wherein the each of the 12 commutator segments is connected in parallel to another commutator segment spaced six segments from it.
19. A DC electric motor as set forth in claim 13, further including a second series of coil windings formed around each of the pole teeth and connected to the commutator segments that are not connected to the first mentioned series of coil windings.
20. A DC electric motor as set forth in claim 19, wherein electrical energy flows through adjacent coil pairs in the second series of coils in opposite directions upon rotation of said machine.
21. A DC electric motor as set forth in claim 20, wherein the number m of permanent magnets is an even number of four or more, the number t of the magnetic pole teeth is $m+2$, the number s of the commutator segments is $2t$ and the number b of the brushes is m .

22. A DC electric motor as set forth in claim 20, wherein the number m of the magnets is four, the number t of the magnetic pole teeth is six, the number s of the segments is twelve, and the number b of the brushes is two, three or four.

**COPIES OF EVIDENCE SUBMITTED
AND RELIED UPON BY APPELLANT**

None

COPIES OF DECISIONS
IN RELATED APPEALS AND INTERFERENCES

None

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**REQUEST TO CONSIDER ATTACHED APPEAL BRIEF AND
BRIEF FEE AS BEING FILED TIMELY**

Dear Sir:

In response to a Final Office Action, dated September 20, 2005, a subsequent informal submission of a Proposed Amendment, entry of which was originally denied on December 19, 2005, applicant filed a Notice of Appeal and Request For Entry on December 20, 2006. These were not replied to until the Decision, dated August 1, 2006 affirming the Examiner's position. the Commissioner is requested to have the accompanying Brief as timely filed because until that time applicant's attorney had no idea what form the claims on appeal would take.

After a Status letter and a call to the Group Supervisor, the Decision mailed August 1, 2006 denied applicants request, but was silent as to when a Brief was due since at that time the Statutory Period had run. Thus it is requested that the case not be considered Abandoned due to the delay in response from the Office.

Respectfully submitted:


Ernest A. Beutler
Reg. No. 19901

Phone (949) 721-1182
Pacific Time